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10/067,912	02/08/2002	Satoshi Shigematsu	500.41177X00	8686

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ANTONELLI, TERRY, STOUT & KRAUS, LLP  
1300 NORTH SEVENTEENTH STREET  
SUITE 1800  
ARLINGTON, VA 22209-9889

EXAMINER

OMETZ, DAVID LOUIS

ART UNIT

PAPER NUMBER

2653

DATE MAILED: 05/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/067,912

Applicant(s)

SHIGEMATSU, SATOSHI

Examiner

David L. Ometz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) 6 and 7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-5 is/are rejected.
- 7) ☒ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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1. Applicant's election with traverse of Group I, claims 1-5 in Paper No. 5 is acknowledged. The traversal is on the ground(s) that the amendment to the method claims (Group II, claims 6-7) now makes the claims are now coextensive in scope and therefore the restriction requirement should be withdrawn. This is not found persuasive because Group II (the method claims 6-7) still includes the requirement for specific steps used in forming the magnetic head which include such process steps as removing lift-off resist and ion milling at specific angles, not required by Group I. Therefore, distinctness between Group I and Group II is still maintained.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 6-7 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Group II, there being no allowable generic or linking claim.

Applicant timely traversed the restriction (election) requirement in Paper No. 5.

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

4. Figures 4-7 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an

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international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claim 5 is rejected under 35 U.S.C. 102(e) as being anticipated by Carey et al (US Pat 6266218). As per claim 5, Carey et al shows a magneto-resistive head in figure 9 comprising: inherent first and second magnetic shield films; a spin bulb film 74/76/78/80 formed between the first and the second shield films via an inherent insulation film; a soft-magnetic film 86 arranged to be in contact with both end portions of a free layer 78 of the spin bulb film; an anti-ferromagnetic film 92 arranged so as to be in contact with the lower portion of the soft-magnetic film 86 and not in contact with the free layer 78 of the spin bulb film; and an inherent electrode film for applying a signal detection current to the spin bulb film.

7. Claim 5 is rejected under 35 U.S.C. 102(b) as being anticipated by Lin et al (US Pat 6185078). As per claim 5, Lin et al shows a magneto-resistive head in figures 15 and 17 comprising: first and second magnetic shield films S1/S2; a spin bulb film "SV" formed between the first and the second shield films via an insulation film G1/G2; a soft-magnetic film 450 (NiFe) arranged to be in contact with both end portions of a free layer 432 of the spin bulb film; an anti-ferromagnetic film 419 (NiO) arranged so as to be in contact with the lower portion of the soft-magnetic film 450 and not in contact with the free layer 432 of the spin bulb film; and electrode film 456 for applying a signal detection current to the spin bulb film.

8. Claims 1 and 3 are rejected under 35 U.S.C. 102(e) as being anticipated by Webb et al (US Pat Publication 2003/0011943).

As per claim 1, Webb et al shows a magneto-resistive head in figures 7 and 15B comprising: first and second magnetic shield films S1/S2; a spin bulb film 152/150/154/156 formed between the first and the second shield films via an insulation film 76/78; a soft-magnetic

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film 714/716 arranged to be in contact with both end portions of a free layer 152 of the spin bulb film; a permanent magnet film 142/146 arranged so as to be in contact with the lower portion of the soft-magnetic film 714/716 and not in contact with the free layer 152 of the spin bulb film; and an electrode film 718/720 for applying a signal detection current to the spin bulb film.

As per claim 3, the magneto-resistive head as claimed in Claim 1, wherein the soft-magnetic film 714/716 has a saturation magnetic flux density not smaller than 0.8 multiplied by a saturation magnetic flux density of the free layer of the spin bulb film. Specifically, as both the soft magnetic films 714/716 and the free layer 152 are made of NiFe, the saturation magnetic flux densities would be the same, thus meeting the limitations of claim 3.

9. Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Gill (US Pat 5867351).

As per claim 1, Gill shows a magneto-resistive head in figure 12 comprising: first and second magnetic shield films (fig. 7); a spin bulb film 202/204/206 formed between the first and the second shield films via an insulation film G1; a soft-magnetic film 304/306 arranged to be in contact with both end portions of a free layer 202 of the spin bulb film; a permanent magnet film 302 arranged so as to be in contact (along the edges) with the lower portion of the soft-magnetic film 304/306 and not in contact with the free layer 202 of the spin bulb film; and an electrode film 108/110 for applying a signal detection current to the spin bulb film.

As per claim 3, the magneto-resistive head as claimed in Claim 1, wherein the soft-magnetic film has a saturation magnetic flux density not smaller than 0.8 multiplied by a saturation magnetic flux density of the free layer of the spin bulb film. Specifically, as both the

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soft magnetic films 304/306 and the free layer 202 are made of NiFe, the saturation magnetic flux densities would be the same, thus meeting the limitations of claim 3.

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gill. Gill shows a spin bulb magnetoresistive head in figure 12 with a soft-magnetic film 304/306 arranged to be in contact with both end portions of a free layer 202. However, Gill is silent as to the thicknesses of the two layers and therefore the product of the saturation magnetic flux density of the soft-magnetic film multiplied by the film thickness is 1 to 10 multiplied by the product of the saturation magnetic flux density of the free layer of the spin bulb film multiplied by the film thickness is not specifically disclosed. However, as reasonably suggested by figure 12, the soft magnetic layer 304/306 is about 2-3 times the thickness of the free layer 202, and therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the film thickness of the soft-magnetic film 304/306 between 1 and 10 times the thickness of the free layer 202 as doing this provides space for the remaining layers of the MR head (namely the pinned layer and spacer layer).

12. Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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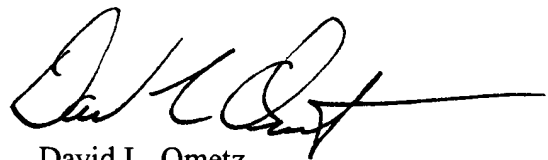
13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The references cited all show magnetoresistive heads with longitudinal biasing of the free layer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David L. Ometz whose telephone number is (703) 308-1296.

The examiner can normally be reached on M-W, 6:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch can be reached on (703) 305-6137. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David L. Ometz  
Primary Examiner  
Art Unit 2653

DLO  
5/10/04